

1. $(2x^2 - 5x + 3)$

$$(2x - 3)(x - 1)$$

$\swarrow \quad \searrow$
 $3x$
 $\swarrow \quad \searrow$
 $2x$

✓

2. $\frac{3x^3}{3x} - \frac{18x^2}{3x} + \frac{15x}{3x}$

$$x^2 - 6x + 5$$

$$3x(x - 5)(x - 1)$$

✓

3. $(4x^2 - 81)$

$$(2x + 9)(2x - 9)$$

✓

4. Solve the equation: $x^2 + 3x - 10 = 0$

$$(x+5)(x-2)$$

$$x = -5$$

$$x = 2$$

5. Find the domain of the rational function: $f(x) = \frac{\cancel{2x-2}}{x-7} = 0$

$$\text{Bottom} = 0$$

$$\begin{array}{r} +7 \quad +7 \\ \hline x \neq 7 \end{array}$$

$$(-\infty, 7) \cup (7, \infty) \checkmark$$

6. Find the product and simplify if possible: $\frac{x^2 - 49}{x^2 - 3x - 28} \cdot \frac{x+4}{x}$

$$\frac{\cancel{(x-7)}(x+7)}{\cancel{(x-7)}\cancel{(x+4)}} \cdot \frac{\cancel{x+4}}{x}$$

$$\frac{x+7}{x} \quad \checkmark$$

7. Perform the indicated operation:

$$\frac{-x+2}{x} - \frac{x-5}{6x}$$

$$\frac{-6x+12-x+5}{6x}$$

$$\boxed{\frac{-7x+17}{6x}}$$



8. Solve the equation: $\frac{a}{a-8} = \frac{+6}{a-4}$

$$a^2 - 4a = -6a + 48$$

$$\begin{array}{r} +6a - 48 \\ +6a - 48 \end{array}$$

$$a^2 + 2a - 48 \quad 8 \quad 6$$

$$(a + 8)(a - 6)$$

$$a = -8 \quad a = 6$$

✓ ✓

9. In 2 minutes, a conveyor belt moves ~~500~~ pounds of recyclable aluminum from the delivery truck to a storage area. A smaller belt moves the same quantity of cans the same distance in 9 minutes. If both belts are used, find how long it takes to move the cans to the storage area.

F A R
d e
d i
p

$$\left(\frac{9}{9}\right) \frac{1}{2} + \frac{1}{9} \frac{2}{2}$$

$$\frac{9}{18} + \frac{2}{18} = \frac{11}{18}$$

✓

$$\begin{array}{r} 18 \\ \hline 11 \end{array}$$

10. Given the function: $f(x) = x^2 - 3x + 1$, find the following function values:

a) $f(\underline{3})$

$$\begin{aligned} &3^2 - 3(\underline{3}) + 1 \\ &9 - 9 + 1 \\ &\textcircled{1} \checkmark \end{aligned}$$

b) $f(\underline{0})$

$$\begin{aligned} &0^2 - 3(\underline{0}) + 1 \\ &0 - 0 + 1 \\ &\textcircled{1} \checkmark \end{aligned}$$

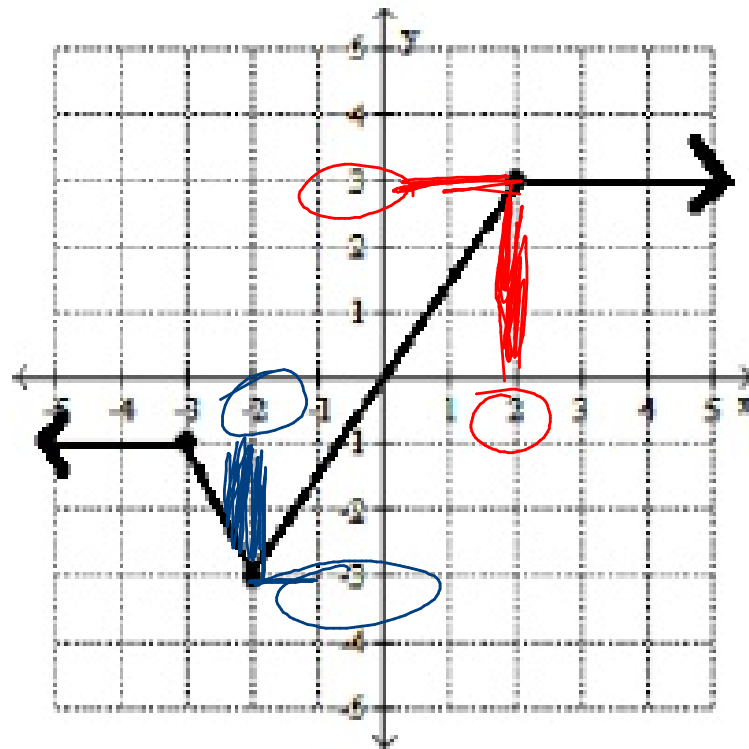
c) $f(\underline{-1})$

$$\begin{aligned} &(-1)^2 - 3(\underline{-1}) + 1 \\ &1 + 3 + 1 \\ &\textcircled{5} \checkmark \end{aligned}$$

d) $f(\underline{-2})$

$$\begin{aligned} &(-2)^2 - 3(\underline{-2}) + 1 \\ &4 + 6 + 1 \\ &\textcircled{11} \checkmark \end{aligned}$$

11. Use the graph of the function f to find $f(2)$ and $f(-2)$:



12. Solve the system of equations by the substitution method:

$$\begin{cases} 3x - 7y = 17 \\ y = x - 3 \end{cases}$$

$$3x - 7(x - 3) = 17$$

$$3x - 7x + 21 = 17$$

$$-4x + 21 = 17$$

$$\begin{array}{r} -21 \quad -21 \\ \hline \end{array}$$

$$\begin{array}{r} -4x = -4 \\ \hline -4 \quad -4 \end{array}$$

$$x = 1$$



$$y = x - 3$$

$$y = 1 - 3$$

$$y = -2$$



13. Solve the system of equations by the addition method:

$$\begin{cases} y = 7 + 3x \\ 6x - 2y = -14 \end{cases}$$

$$6(-3x + y = 7)$$

$$\cancel{-18x + 6y = 42}$$

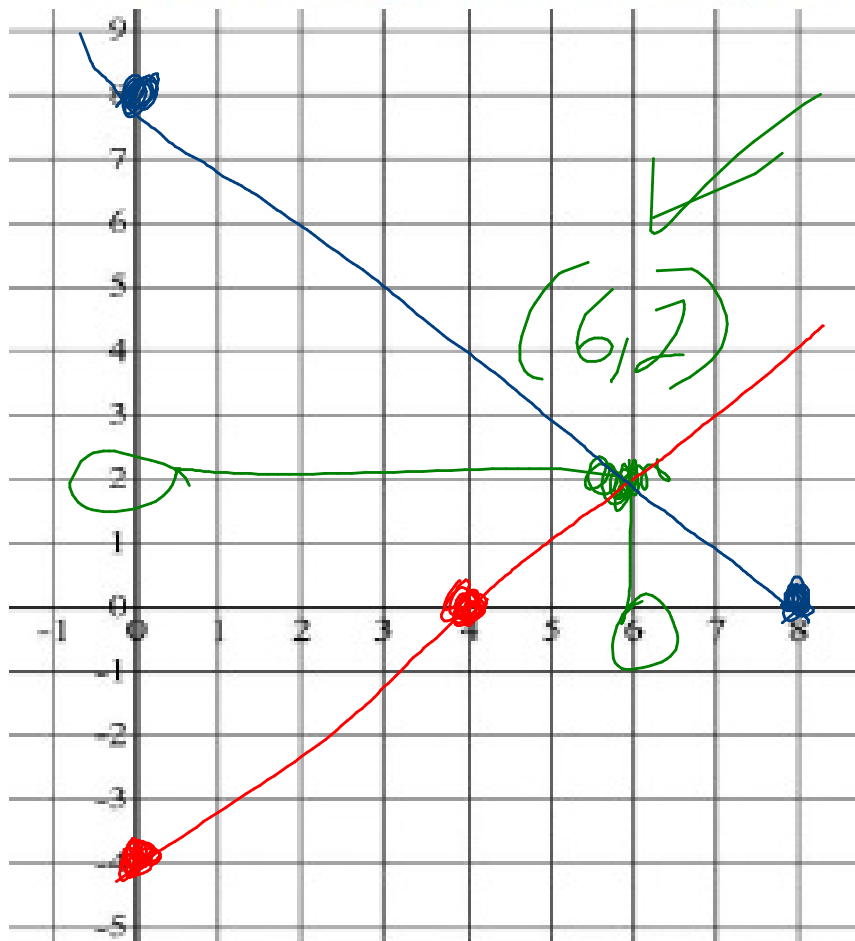
$$3(6x - 2y = -14)$$

$$\cancel{18x - 6y = -42}$$

Infinite



14. Solve the system of linear equations by graphing: $\begin{cases} x + y = 8 \\ x - y = 4 \end{cases}$



$$x + y = 8$$

x	y
0	8
8	0

$$x = 8$$

$$x = 8$$

$$x - y = 4$$

x	y
0	-4
4	0

$$-y = 4 \quad y = -4$$

$$x = 4$$

15. Find the equation of the line passing through the given points $(-1, 8)$ and $(0, 3)$. Use function notation to write the equation.

$x_1 \ y_1 \ x_2 \ y_2$

$$\text{slope } M = \frac{y_1 - y_2}{x_1 - x_2} = \frac{8 - 3}{-1 - 0} = \frac{5}{-1} = -5$$

$$y = mx + b$$

$$3 = -5(0) + b$$

$$3 = b$$

$$y = -5x + 3$$


16. If y varies directly as x , find the constant of variation k and the direct variation equation for the situation. $y = 2$ when $x = 12$

~~Y~~ Dir. et X

$$Y = \frac{1}{6} X$$

$$2 \div 12$$

$$\frac{2}{12} = \frac{1}{6} = k$$

$$Y = \frac{1}{6} X$$


17. Solve the absolute value equation $|x - 6| + 2 = 4$

As Is

$$\overset{-2 \quad -2}{|x - 6| = 2} \quad \text{Opp}$$

$$x - 6 = 2$$

$$\begin{array}{r} +6 \quad +6 \\ \hline \end{array}$$

$$x = 8$$

✓

$$x - 6 = -2$$

$$\begin{array}{r} +6 \quad +6 \\ \hline \end{array}$$

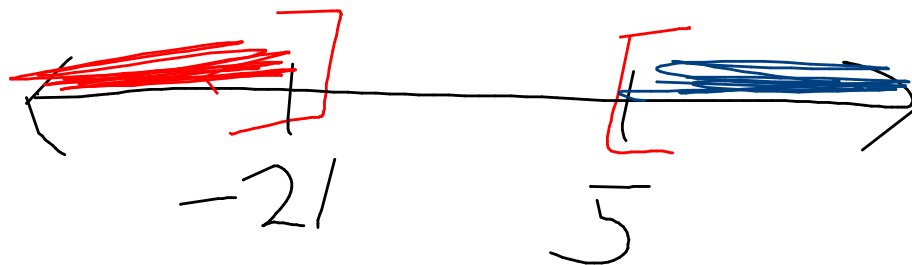
$$x = 4$$

✓

18. Solve the inequality $|x+8| \geq 13$. Graph the solution. Write the solution using interval notation.

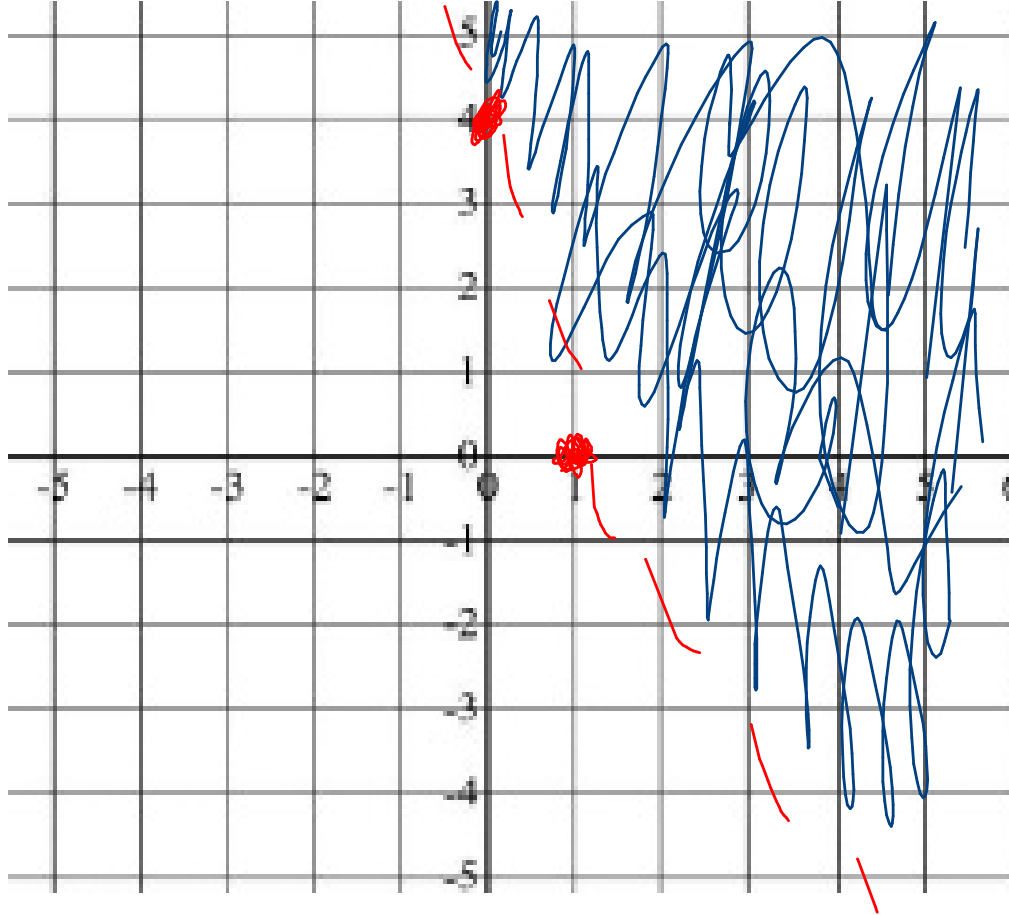
$$\begin{array}{r} x+8 \geq 13 \\ -8 \quad -8 \\ \hline x \geq 5 \end{array}$$

$$\begin{array}{r} x+8 \leq -13 \\ -8 \quad -8 \\ \hline x \leq -21 \end{array}$$



$$(-\infty, -21] \cup [5, \infty)$$

19. Graph the following inequality: $4x + y > 4$



$x = 0$

$y > 4$

$(0, 4)$

$>$

up

$y = 0$

$4x > 4$

$\frac{4}{4} > \frac{4}{4}$

$x > 1$

$(1, 0)$

20. Simplify the following radical expressions. Assume that variables represent positive real numbers. $\sqrt[3]{-8x^{15}}$

\downarrow

$$-2x^5 \checkmark$$

21. Use the quotient rule to simplify:

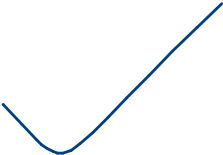
$$\sqrt{\frac{5x^4}{16y^2}}$$

$$\frac{\sqrt{5}x^2}{4y} \checkmark$$

22. Subtract the following radicals: $6\sqrt{75} - 2\sqrt{20} - 2\sqrt{27}$

$$\begin{array}{ccc} \sqrt{25}\sqrt{3} & \sqrt{4}\sqrt{5} & \sqrt{9}\sqrt{3} \\ \rightarrow 5 & \rightarrow 2 & \rightarrow 3 \end{array}$$

$$30\sqrt{3} - 4\sqrt{5} - 6\sqrt{3}$$


$$24\sqrt{3} - 4\sqrt{5}$$

23. Solve the radical equation: $\sqrt{4x-7}-1=4$

$$\begin{array}{r}
 \sqrt{4x-7}-1=4 \\
 +1 \quad +1 \\
 \hline
 \sqrt{4x-7} = 5 \\
 4x-7 = 25 \\
 +7 \quad +7 \\
 \hline
 4x = 32 \\
 \cancel{4}x = \cancel{3}2 / 4
 \end{array}$$

$x=8$ ✓

24. Solve the radical equation: $\sqrt[3]{3x}=3$

$$\begin{array}{r}
 \sqrt[3]{3x} = 3 \\
 \cancel{3}x = \cancel{2}7 \\
 \cancel{3} \quad \cancel{3}
 \end{array}$$

$x=9$ ✓

25. Add and write answer in a+bi form: $(8-4i) + (8+3i)$

$$16 - 1i \checkmark$$

26. Subtract and write answer in a+bi form: $(7-4i) - (8-3i)$

\checkmark

$-1 - 1i$

$-4i - (-3i)$

27. Multiply and write answer in $a+bi$ form: $(3-2i)^2(3-2i)$

$$\begin{aligned} & (3-2i)^2(3-2i) \\ & (9-6i-6i+4i^2)(3-2i) \\ & (9-12i-4)(3-2i) \\ & (5-12i)(3-2i) \end{aligned}$$

✓

28. Multiply and write answer in $a+bi$ form: $3i(5-8i)$

$$\begin{aligned} & 3i(5-8i) \\ & 15i-24i^2 \\ & 15i+24 \end{aligned}$$

✓

29. Solve using the quadratic formula: $x^2 - x - 1 = 0$

$$A \ 1 \ B -1 \ C -1$$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{1 \pm \sqrt{(-1)^2 - 4(1)(-1)}}{2(1)}$$

$$\frac{1 \pm \sqrt{1 + 4} = \sqrt{5}}{2}$$

✓

$$\boxed{\frac{1 \pm \sqrt{5}}{2}}$$

30. Solve using the quadratic formula: $x^2 + 6x + 13 = 0$

A 1 B 6 C 13

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{-6 \pm \sqrt{6^2 - 4(1)(13)}}{2(1)}$$

$$\frac{-6 \pm \sqrt{36 - 52} = \sqrt{-16} = 4i}{2}$$

2

$$\frac{-6 \pm 4i}{2}$$

$$= \boxed{-3 \pm 2i}$$

✓